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I am sending these comments on the proposed Microsoft antitrust settlement, in accord with the Tunney Act.

As a researcher in the field of theoretical neuroscience, I am deeply concerned about deficiencies in the Proposed Final Judgment (PFJ) that could allow Microsoft's abusive behavior to continue in a manner harmful to our nation's scientific community. Below I (1) briefly describe my work, as an example of a typical use of computing in science, (2) discuss open source and free software development, non-commercial activity which is essential to the health of academic research, (3) comment on the threat posed by Microsoft to such software, and the inadequacy of the provisions in Sections III and IV of the PFJ to protect against this threat. It should be noted that although academia is a small "niche" market compared to the general public, it is behind much of the nation's technological, and hence economic, development.

(1) My research relies heavily on scientific computing, by which I mean the use of intensive calculation in the solution of scientific problems. Specifically, I create and operate software that simulates the biological activity of neurons (cells responsible for, among other things, brain function), using both standard programming languages (eg, C) and commercial products that provide a computing environment (eg, MATLAB by the Mathworks Corporation). These simulations serve as tests of theories of neural behavior and function. In addition to increasing our basic understanding of life processes, such work by me and others contributes to the development of technologies ranging from medical devices to improved electronics.

Scientific advancement requires effective interaction between researchers. While publication in academic journals is still important, direct communication via email and the sending of documents, data and computer code over the Internet now form an integral part of almost all collaborations. Computers thus have a dual value to the scientist: they are indispensable directly as computing tools, but also as communication tools.

(2) For me and most of my colleagues, the unquestionably best choice of operating system is Linux, a well known alternative to Microsoft Windows. Linux is superior in this context because it is computationally efficient; is typically packaged with a number of applications useful in scientific computing, communication and publication; has advanced scripting, automating and project management capabilities; can be extensively customized for a given task; and is available at little or no cost, which is especially important for publicly funded projects.

As described in Judge Jackson's Findings of Fact, Linux was produced primarily under the "open source" model of software development, in which many developers, often in disparate parts of the world and with no contractual arrangements between them, cooperate in correcting and extending the body of code which forms the software. Typically, most if not all of these developers volunteer their efforts. However, open source is not equivalent to free of charge; for example, the for-profit company Red Hat sells a popular distribution of Linux. Researchers typically use a mixture of free and commercial software.

Academic research in general, and scientific computation in particular, has thrived on the spirit of open sharing of software. In addition to the Linux operating system, such activity has created many valuable

applications, for example sendmail (which led to the widespread use of email as a means of communication) and LaTeX (a typesetting program which is a universal standard for document preparation among mathematicians and physicists). Moreover, the TCP/IP protocols (which form the backbone of the Internet) and the HTML standard (which created the World Wide Web) were produced in academic environments and released to the public domain.

Another example of the importance of the open source nature of Linux to current research is provided by colleagues here at Boston University. They are extending state of the art technology, known as the dynamic clamp, which allows the design of an unprecedented set of experiments involving the interaction of a computer with biological tissue. A crucial component of the technology is a variant of the Linux operating system, known as Real Time Linux, which they have adapted to their needs. It is the open source model which gave them the necessary access to the basic code of the operating system (and in the same spirit they have made their improvements available to the community).

(3) Microsoft has publicly acknowledged its hostility to the open source community. For example, Microsoft Senior Vice President Craig Mundie has repeatedly argued that the General Public License (GPL), which promotes open source software and which governs the release of GNU/Linux, is a threat to the software industry, and Microsoft Chief Executive Steve Ballmer referred to software released under the GPL as a "cancer". While these comments are specifically about the GPL, they are widely seen as part of a general anti-Linux strategy. In particular, Microsoft is committed to the development of its .Net platform, but lacks total control over the market due to the existence of the highly popular open source server software apache, which runs under Linux. See CNET for example articles summarizing the GPL comments (http://news.com.com/2100-1001-270684.html), and the consequence of Linux for Microsoft's long term goals (http://news.com.com/2100-1001-268520.html?legacy=cnet).

Given that Linux is currently the source of Microsoft's strongest competition, it is shocking that the PFJ, which is supposed to prevent Microsoft's illegal abuse of its monopoly, specifically condones discrimination against Linux. In particular, Section III.J(2) exempts Microsoft from disclosing information or providing licensing (of protocols I discuss below) to not-for-profit organizations. Since the benefits of the open source community, which created Linux, derive precisely from a mix of for-profit and volunteer efforts, this Section allows Microsoft to continue abuses against its primary competitors.

J(2)b says organizations seeking information or a license must have "a reasonable business need for the API, Documentation or Communications Protocol for a planned or shipping product". J(2)c requires that the organization "meets reasonable, objective standards established by Microsoft for certifying the authenticity and viability of its business". Under this wording, organizations which develop a "free" open source operating system or application could be denied status as a "business", and hence have no remedy under the PFJ. It is especially onerous that it is left to Microsoft to establish the standards for what constitutes "authenticity" and "viability".

The protocols in question are for "anti-piracy systems, anti-virus technologies, license enforcement mechanisms, authentication/ authorization security, or third party intellectual property protection mechanisms". While seemingly restricted to certain sensitive systems, this list potentially impacts all software. Even something as simple as a request for a new window could require a form of authentication, for example if that request comes from a networked application. This clause also affects any program which needs access to Windows file systems, such as the popular open source cross-platform file system SAMBA, because access to a hard drive or other storage medium has potential impacts on piracy, viruses and intellectual property concerns. As its past behavior has shown, Microsoft is willing and able to exploit such loopholes.

Moreover Section IV, concerning Compliance and Enforcement Procedures, provides no specific mechanism through which Microsoft can be brought into compliance if it is determined that it is not. The Technical Committee established under IV(B) has authority only to investigate and report. IV(A) gives the plaintiffs exclusive responsibility for enforcing the judgment, but describes no procedures by which they should do so. In fact, IV(A)4 authorizes plaintiffs to seek necessary orders from the Court, essentially guaranteeing further litigation and eliminating any value of the PFJ.

For reasons outlined in (2) above, there are powerful incentives for certain researchers to use the Linux operating system. However, Microsoft's monopoly, and the consequent widespread use of its proprietary file formats, introduce significant costs due to interoperability limitations. Moreover, the monopoly has the indirect effect of discouraging some third party software vendors from porting their products to other operating systems. To the extent that its goal is specifically to reduce the availability and quality of Linux and other open source software, Microsoft threatens to significantly harm users of scientific computing. While it is doubtful that this result is intentional, it is an unavoidable consequence of the fact that important software development is being done at the interface of for-profit and not-for-profit organizations. Any settlement which does not include strong guarantees against abusive practices towards open source software will create a damaging ripple effect, which could hamper the future advancement of science and technology.

In summary, I ask you to reject the PFJ as written, and seek more effective remedies that preserve the value and viability of open source software, including for those outside the information technology industry.

Sincerely,
Jason Ritt